Remarks

The Office action mailed April 3, 2007, has been reviewed and carefully considered. The specification has been amended to correct typographical errors noted by the examiner. Claims 1, 5, 8-10, 16, 18, 34, 37, 38, and 42 have been amended. New claims 47-62 have been added. Support for new claim 47 is found in the specification, for example, at page 6, lines 32-35 and page 14, lines 24-36. Support for new claim 48 is found in the specification, for example, at page 14, lines 5-23. Support for new claim 50 is found in the specification, for example, at page 25, lines 24-27, and page 26, lines 18-20. Support for new claims 51, 53 and 54 is found in the specification, for example, at page 34, Example 2 and page 35, Table 1. Support for new claim 52 is found in the specification, for example, at page 37, Example 3. Support for new claims 56 and 58 is found in the specification, for example, at page 2, lines 18-24; page 15, lines 28-38; page 34, lines 12-14; and page 35, Table 1, column 1. Support for new claims 57, 59 and 60 is found in the specification, for example, at page 15, lines 35-38. Support for new claims 61 and 62 is found in the specification, for example, at page 13, lines 32-35. Entry of these amendments is respectfully requested.

35 U.S.C. §112 Rejections

The 35 U.S.C. §112, second paragraph, rejections are now moot in view of the clarifying, but not limiting, amendments to the previously-rejected claims. Of note, claims 16, 18 and 42 have been amended to clarify that the pharmaceutical composition includes a pharmaceutically acceptable "vehicle" that is distinct from the carrier moiety forming part of the conjugate. Support for the amendment to claim 16, 18 and 42 is found, for example, in the specification at page 20, lines 22-23.

Claims 5 and 34-44 have been rejected under 35 U.S.C. §112, first paragraph, because the specification allegedly does not enable "analogs or mimetics" of the specific carriers recited in these claims. The application does, in fact, provide detailed guidance of how one would select and synthesis analogs or mimetics of carriers (see page 16, line 1 – page 18, line 18). The PTO has not provided any evidence showing that a person of ordinary skill would have any reason to

doubt the teachings of this passage, or that it would require undue experimentation to make and use analogs or mimetics of the specific carriers recited in claims 5 and 34. In any event, this rejection is now moot in light of the amendments to claims 5 and 34.

35 U.S.C. §102 Rejection

Claims 34-38 were rejected under 35 U.S.C. §102(b) over Alkan et al. This rejection should be withdrawn in view of the amendment to claim 34.

35 U.S.C. §103 Rejection

Claims 1-6, 8, 9 and 11-15 have been rejected under 35 U.S.C. §103 over Alkan et al. combined with Welkos et al. and Pozsgay et al. This rejection must be withdrawn because (1) the purported combination would not have resulted in the conjugate of claims 1-6, 8, 9 and 11-15 and (2) there would have been no reason to combine the cited references.

The Office action on page 7 states that "Welkos et al teach that *B. anthracis* protective antigen and γDPGA result in antibody production following vaccination and that improved vaccines could therefore contain these multiple antigenic moieties." However, it appears that Welkos et al., in fact, fails to even mention γDPGA, much less whether this moiety would be effective in a vaccine. If the examiner persists in relying upon Welkos et al, applicants' respectfully request that the examiner provide a citation to where Welkos et al. discloses γDPGA. Alkan et al. also does not teach a conjugate that includes a synthetic γPGA as recited in claim 1. Pozgay et al. does not even relate to synthetic polypeptides, much less disclose γPGA. Since none of the cited references individually describe a conjugate or vaccine that includes a synthetic γPGA, the purported combination certainly would not have resulted in the conjugate of claim 1.

Moreover, there would have been no reason to make the combination asserted by the PTO. The Office action asserts that it would have been obvious to combine Alkan et al, Welkos et al. and Pozsgay et al. in order to maximize any anti-*Bacillus* responses. However, a person of

ordinary skill in the art with these references in front of them would have no inkling that the immunogenic response could be enhanced by focusing on γPGA, particularly synthetic γPGA.

Alkan et al. discloses a conjugate that includes a γPGA hapten, but the import of Alkan et al. is that RAT can be allegedly used as an immunogenic-enhancing carrier. Thus, one reviewing Alkan et al. would have been focused on the carrier rather than γPGA.

Welkos et al. simply explores the immune responses to protective antigen (PA) which is contained in the human vaccine Anthrax Vaccine Absorbed (AVA). There is nothing in Welkos et al. that would have taught one how to further maximize an anti- *Bacillus* response. Indeed, Welkos et al. is not even relevant since it completely fails to even mention γPGA.

Pozsgay et al. is directed to a conjugate of a polysaccharide hapten with a protein carrier for treating *Shigella dysenteriae*. They report that certain synthetic versions of the polysaccharide elicit higher levels of antibodies compared to a conjugate prepared from the native polysaccharide. However, there would have been no reasonable expectation from a teaching of a synthetic polysaccharide that a synthetic polypeptide would also be useful. The chemical structures of a polysaccharide and a polypeptide are very different, their immunogenic activities are very different, and the pathogenesis of *Shigella dysenteriae* and *Bacillus anthracis* are very different. Moreover, it is well known that the immune response to an experimental conjugate is very unpredictable. Thus, it cannot be predicted whether a synthetic hapten or a native hapten might be the most useful for treating any particular illness.

In addition, there is a marked difference in the chemical structure of the Alkan et al. conjugate and the conjugate presently recited in claims 13, 14 and 56-60. The conjugates of these claims include a plurality of γPGA polypeptide chains covalently linked to a carrier molecule (see, e.g., page 15, lines 28-38 of the present application). In contrast, the Alkan et al. construct includes a plurality of RAT molecules (carrier) linked to a single PGA molecule (see the Abstract and page 358, first column, "The use of PGA-RAT conjugates reversed the customary small hapten-large carrier relationship, and resulted in conjugates that bore multiple carrier moieties"). Furthermore, RAT is a small molecule. Claims 5, 61 and 62 are directed to

large molecule carriers. The Alkan et al. conjugate has a structure resembling a long wire of PGA to which a plurality of small RAT carrier molecules are attached. The conjugates of claims 5, 13, 14, and 56-62 have a structure of a large carrier molecule to which a plurality of peptide (γPGA) chains are attached. Since there is such a stark difference in the Alkan et al. structure, Alkan et al. would not have suggested a PGA conjugate with a plurality of γPGA chains attached to a large molecule carrier.

It is respectfully submitted that the application is in condition for allowance. Should there be any questions regarding this application, examiner Swartz is invited to contact the undersigned attorney at the telephone number shown below.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 595-5300
Facsimile: (503) 595-5301

By 
Wayne Rupert
Registration No. 34,420